REMARKS

Claims 25-49 are currently pending in this application. Claims 25-49 have been added by this preliminary amendment.

All pending claims are believed patentable and Applicant requests a Notice of Allowance from the Examiner. Should the Examiner have any questions or believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

Respectfully submitted,

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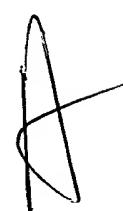
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Please cancel claims 1-24 without prejudice.

Please add the following claims:

25. (new) A computer peripheral connected to a host computer for enabling a user to provide input to a graphical simulation running on said host computer and for providing vibration feedback to said user, said vibration feedback corresponding with displayed interactions within said graphical simulation, said computer peripheral comprising:

an analog sensor responsive to finger motion of a user during operation of said computer peripheral;

an inertial mass actuator that selectively generates an inertial vibration that a user can feel when operating said computer peripheral; and

a signal processor separate from said host computer, said signal processor connected to said analog sensor and said inertial mass actuator, said signal processor operative to communicate with said host computer, wherein said signal processor sends information to said host computer including sensor data from said analog sensor, and wherein said signal processor controls said inertial mass actuator to produce said inertial vibration by producing an activating signal in response to received data from said host computer.

26. (new) A computer peripheral as recited in claim 25 wherein said signal processor includes a computer processor.

27. (new) A computer peripheral as recited in claim 25 wherein said displayed interaction is the collision of two virtual objects within said graphical simulation.

28. (new) A computer peripheral as recited in claim 25 wherein said inertial mass actuator is a first inertial mass actuator, and further comprising a second inertial mass actuator, said second inertial mass actuator controlled by said signal processor in response to data received from said host computer.

29. (new) A computer peripheral as recited in claim 28 wherein said first inertial mass actuator and said second inertial mass actuator are controlled simultaneously to produce complex tactile feedback sensations felt by said user.

30. (new) A computer peripheral as recited in claim 25 wherein said inertial mass actuator includes a rotating eccentric mass mounted on a motor shaft, said eccentric mass imparting vibration forces to said user.

31. (new) A computer peripheral as recited in claim 25 wherein said inertial mass actuator includes a ferrous mass that is vibrated by a changing magnetic field to impart vibration forces to said user.

32. (new) A computer peripheral as recited in claim 25 wherein said computer simulation includes a graphical representation of a human body part, wherein the motion of said graphical representation of said human body part is updated in response to changes in data from said analog sensor.

33. (new) A computer peripheral as recited in claim 32 wherein said human body part is a graphical representation of a human hand.

34. (new) A computer peripheral as recited in claim 33 wherein said vibration feedback corresponds with a displayed collision between said graphical representation of said human hand and another displayed graphical object within said graphical simulation.

35. (new) A computer peripheral as recited in claim 25 wherein said inertial mass actuator is mounted on a compliant spring to amplify said inertial vibration.

36. (new) A computer peripheral as recited in claim 25 wherein said analog sensor is a potentiometer.

37. (new) A computer peripheral as recited in claim 25 wherein said analog sensor is an optical sensor.

38. (new) A computer peripheral as recited in claim 25 wherein said inertial vibration is controlled such that the frequency of said vibration is varied over time.

39. (new) A computer peripheral as recited in claim 38 wherein said inertial vibration is controlled such that the magnitude of said vibration is varied over time.

40. (new) A computer peripheral as recited in claim 29 wherein both inertial mass actuators generate vibrations by imparting centrifugal forces, wherein vibration forces of greater magnitude are imparted by increasing the angular velocity of said inertial mass actuators.

41. (new) A computer peripheral connected to a host computer for enabling a user to control a graphical simulation on said host computer and for providing vibration feedback to said

user, said vibration feedback corresponding with displayed interactions within said graphical simulation, said computer peripheral comprising:

an analog sensor responsive to finger motion of a user during operation of said computer peripheral;

a plurality of inertial mass actuators that selectively generate vibrations that a user can feel when operating said computer peripheral, said vibrations generated by imparting an angular velocity on a mass associated with each of said inertial mass actuators; and

a signal processor separate from said host computer, said signal processor connected to said analog sensor and each of said inertial mass actuators, said signal processor operative to communicate with said host computer, wherein said signal processor sends information to said host computer including sensor data from said analog sensor, and wherein said signal processor controls said angular velocity of each of said inertial mass actuators to produce said vibrations of controllable magnitude and frequency in response to received data from said host computer.

42. (new) A computer peripheral as recited in claim 41 wherein said signal processor includes a computer processor.

43. (new) A computer peripheral as recited in claim 41 wherein said displayed interaction is the collision of two virtual objects within said graphical simulation.

44. (new) A computer peripheral as recited in claim 44 wherein said inertial mass actuators are controlled simultaneously to produce complex tactile feedback sensations felt by said user.

45. (new) A computer peripheral as recited in claim 41 wherein said inertial mass actuator includes a rotating eccentric mass mounted on a motor shaft, said eccentric mass imparting vibration forces to said user.

46. (new) A computer peripheral as recited in claim 41 wherein said inertial vibration is controlled such that the frequency of said vibration is varied over time.

47. (new) A computer peripheral as recited in claim 41 wherein said inertial vibration is controlled such that the magnitude of said vibration is varied over time.

48. (new) A computer peripheral as recited in claim 41 wherein said inertial mass actuators generate vibrations by imparting centrifugal forces, wherein vibration forces of greater magnitude are imparted by increasing the angular velocity of said inertial mass actuators.

49. (new) A computer peripheral connected to a host computer for enabling a user to provide input to a graphical simulation running on said host computer and for providing vibration feedback to said user, said vibration feedback corresponding with displayed interactions within said graphical simulation, said computer peripheral comprising:

a sensor responsive to finger motion of a user during operation of said computer peripheral, said sensor operative to output values in a range of at least three values representing said finger motion;

an inertial mass actuator that selectively generates an inertial vibration by moving a mass, when said user can feel said inertial vibration when operating said computer peripheral; and

a signal processor separate from said host computer, said signal processor connected to said sensor and said inertial mass actuator, said signal processor operative to communicate with said host computer, wherein said signal processor sends information to said host computer including sensor data derived from said values output by said sensor, and wherein said signal processor controls said inertial mass actuator to produce said inertial vibration by producing an activating signal in response to received data from said host computer.